



U.S. Department
of Transportation

**Federal Aviation
Administration**

Office of Airport Safety and Standards
Airport Design Division

800 Independence Ave., SW
Washington, DC 20591

Dear Industry Representative:

The enclosed Federal Aviation Administration (FAA) Draft Appendix 3 to Advisory Circular 150/5340-1H, *Standards for Airport Markings*, is being circulated to interested industry associations to obtain comments and recommendations on actions to be taken. The final text may be revised as a result of comments received and further review by the Office of Airport Safety and Standards. Please review this draft and advise the FAA of your concurrence, recommended modifications, or other comments by July 15, 2004.

The attached draft Appendix 3 to Advisory Circular 150/5340-1H is intended to provide standards for enhanced markings for runway holding positions. The new markings consist of three enhancements to current hold line markings:

1. An enhanced taxiway centerline marking leading up to the hold line, which serves as an additional signal to pilots that the aircraft is approaching a hold line;
2. Use of both yellow and white paint on the hold line (white paint on the runway-side dashed line and yellow paint on the taxiway-side solid line) to reinforce pilot awareness of runway location and extension of the holding position marking across the taxiway shoulders to increase visibility for pilots in higher cockpits and for airport vehicles using the shoulder; and
3. Two surface painted holding position signs at the hold line, one on either side of the taxiway centerline, to enhance crew awareness of the aircraft's location.

The FAA is considering whether to use the enhanced markings in combination or separately. While there are benefits from using the markings in combination, each component of the enhanced markings might not be necessary in all locations. For example, at general aviation airports, the surface painted holding position sign on the right (co-pilot) side of the taxiway and the extension of the hold lines across the taxiway shoulders might not be cost effective.

Development of the proposed enhanced markings. The draft markings are the result of an extensive effort by the FAA Office of Airport Safety and Standards and the Office of Runway Safety. That effort began with the development and review of a broad variety of alternate marking proposals by a team of government and industry representatives, with contract support from the MITRE Corporation. The team included human factors specialists and an airport painting contractor. The recommendations of the team were reviewed not only for clear meaning and conspicuity but also for practical cost of application.

The team's final recommended changes were tested first in simulators using commercial and general aviation pilots. On the basis of the positive results of the simulator tests, the FAA and MITRE tested the final recommended set of markings in a commercial airport operating environment at T.F. Green Airport in Providence Rhode Island, during the summer of 2003. Evaluation involved surveys and interviews of more than 200 air carrier and general aviation pilots, field evaluation with a test aircraft equipped with head and eye tracking equipment, measurement of taxi speed near hold lines, and assessment of surface incidents/runway incursions.

Pilot reaction to the revised markings as a set was positive. The MITRE summary of evaluation results found the following:

- Survey response to the proposed markings has been positive, with particularly strong ratings for the surface painted holding position signs and the combination of all proposed markings.
- The structured interviews showed little change in pilot opinion of the markings over time.
- Field data supported the simulator results showing that the proposed markings improve detection distances and do not negatively affect typical pilot behavior.
- Overall, findings were consistent with simulator evaluations of the proposed surface markings.

The summary of the MITRE report on the Providence evaluation is available in Adobe Acrobat PDF format from the FAA Airports web site at www.faa.gov/arp/publications/acs/draftacs.cfm.

Cost of application. Installation of the enhanced markings at an airport would involve a one-time cost of removing at least some of the old markings. After that, airport operators could incur some additional cost from regular repainting of hold lines with the new markings due to additional paint and/or paint colors required for the enhanced markings. In addition, the surface painted holding position signs may need to be repainted more frequently than the hold line and centerline, because red paint fades more quickly than yellow or white and must be repainted frequently. MITRE estimated the cost of contracting with an airfield paint contractor to repaint one taxiway/runway intersection would range from \$1,700 to \$2,100, depending on the types of glass beads used.

Applicability. Normally, the draft change to an AC would also include changes to the body of the AC addressing the applicability of the new markings, e.g., when the enhanced markings can be used and when they must be used. In this case, the FAA is instead requesting comment on where the enhanced markings should be adopted as either an optional or required standard. As drafted, the applicability section of the draft Appendix 3 states that the enhanced markings may be used as a set or individually in combination with an existing marking, but that all intersections at an airport must be marked with the same combination of markings. The final applicability provisions of proposed Appendix 3, however, might be revised after consideration of comments on this issue.

Request for comments: In addition to comments on the markings themselves, as proposed in draft Appendix 3, the FAA requests comment on the following issues:

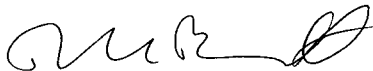
1. Should the enhanced markings be adopted as a unified set or should the separate components of the enhanced markings be available for different airport situations?
2. Should the FAA adopt some but not all components of the proposed enhanced markings? If so, which components should or should not be adopted?
3. If components of the enhanced markings can be used individually, in which cases should each component, or the combination of components, apply?
4. Should the FAA adopt the enhanced markings (A) as a mandatory standard to replace current hold line markings (allowing for a practical implementation period), or (B) as optional standards, to be used at the airport operator's discretion, e.g. as a tool to address runway incursion issues at a particular location?
5. If the enhanced markings are adopted as an optional standard, should they be required at all intersections on an airport at which they are used?

As noted above, please submit your concurrence, recommended modifications, or other comments on draft Appendix 3 by July 15, 2004. For your convenience, draft Appendix 3 and Mitre's summary report are also available on the FAA Airports web site at www.faa.gov/arp/publications/acs/draftacs.cfm.

Comments can be emailed to Ben Castellano at ben.castellano@faa.gov or sent by conventional mail at the following address:

Ben Castellano
Manager, Airport Safety and Operations Div.
Federal Aviation Administration
800 Independence Ave., SW
AAS-300, Room 616
Washington, DC 20591

Sincerely,

A handwritten signature in black ink, appearing to read 'DLB', with a stylized flourish at the end.

David L. Bennett
Director of Airport Safety
and Standards

Enclosure